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Memory effect and triplet pairing generation in the superconducting exchange biased Co/CoOx/Cu41Ni59/Nb/Cu 41Ni59 layered heterostructure

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Abstract

We fabricated a nanolayered hybrid superconductor-ferromagnet spin-valve structure, the resistive state of which depends on the preceding magnetic field polarity. The effect is based on a strong exchange bias (about -2 kOe) on a diluted ferromagnetic copper-nickel alloy and generation of a long range odd in frequency triplet pairing component. The difference of high and low resistance states at zero magnetic field is 90% of the normal state resistance for a transport current of 250 μA and still around 42% for 10 μA. Both logic states of the structure do not require biasing fields or currents in the idle mode.

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